Macs Reef Road, Bywong

Waste Transfer Station

Transport Review

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prepared for

Palerang Council

prepared by

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Introduction

Stapleton Transportation & Planning Pty Ltd (STAP) has been commissioned by Palerang Council (Council) to provide a Peer Review of the traffic and transport assessment completed in regard to the proposed development of a Waste Transfer Station (the Proposal) at the existing Macs Reef Landfill, Macs Reef Road Bywong (the Site).

Our primary assessment document is the Concept Options Report – Macs Reef Waste Transfer Station (CO Report) prepared by Quadro Australia Pty Ltd (Quadro) in February 2010. In reviewing the methodology and conclusions provided in the CO Report, STAP has: -

- Drawn on our previous experience in the assessment of traffic generating developments, including extensive experience in the assessment of waste management sites for VISY, WSN Innova and local Councils across NSW.

- Reviewed the background data, methodology and conclusions provided in the CO Report.

- Provided additional waste stream and traffic generation calculations to ensure that future peak conditions are appropriately considered.

- Discussed key assessment issues with representatives of Quadro and Environmental Planning Services Pty Ltd (EPS) who are coordinating planning for the Site on behalf of Council.

1 Background

Council, as part of its overall waste management strategy, is considering the construction of a small vehicle waste transfer station (WTS) on the Lot containing the Macs Reef Landfill Site to ensure that waste disposal services continue to be provided to the Wamboin/Bywong/Sutton East areas when the landfill reaches its capacity and is closed in some 2 – 3 years time.

Quadro was commissioned to develop a range of concept options for the WTS in terms of both its siting, layout and operational parameters at the Site; options were developed in consultation with Council and a local Working Group (including Council and residents).

Following the development of a draft Concept Options report it was presented to the Working Group for comment and feedback prior to its finalisation and submission to Council for its consideration.

Along with broader issues relating to planning, Site usage and local conditions, the CO Report provides an assessment of the access, traffic and parking characteristics associated with the provision of a WTS at the Site. STAP has specifically prepared this Review to ensure that the CO Report provides an appropriate assessment of: -

- The existing and future traffic generation to/from the Site
- The local access roads and intersections required to accommodate that traffic generation over a suitable operational lifetime
- The on-site access, traffic and parking requirements

As such, our Review has focused on: -

- The determination/calculation of existing and future traffic flows based on potential Site capacity
- The determination/calculation of an appropriate average annual growth factor in traffic flows
- The assignment of trips to the local network and to the key intersection of Macs Reef Road and the Site Access Road
- The determination/calculation of general on-site access and parking demands
- Reference to the appropriate Guidelines/Standards in providing transport recommendations

2 The Existing Site

2.1 Location

The Macs Reef landfill is located on the southern side of Macs Reef Road approximately 3.5 kilometres east of the Federal Highway within the Bywong district. The Site is bounded to the west by an unnamed road (termed Site Access Road by STAP for ease of reference); to the north by Macs Reef Road; and to the east and south by private property. The Site has operated as a local landfill since the 1970's, but Council has advised that it is reaching operational capacity.

2.2 Access

The Site Access Road is a which intersects with Macs Reef Road, a rural collector route which connects to the north-west to the Federal Highway and to the south-west to Bungendore Road (a similar rural collector). Macs Reef Road has a speed limit of 90km/h adjacent to the Site, though anecdotal evidence suggests that speeds in excess of this limit are currently experienced.

The existing intersection of the Site Access Road & Macs Reef Road is a simple priority intersection with no designated turning/passing lanes. Sight distance to both the east and west would appear to conforms with current standards, though it is important to note that traffic generation per se is not a consideration in determining sight distance, i.e. the use of an existing intersection is generally appropriate even if traffic flows increase, based on the reasoning that the intersection would not have been originally formed if sight distance were not appropriate.

A number of other local intersections to Macs Road provide in our opinion some guidance in the determination of future intersection design options for an upgrade of the Site Access Road & Macs Reef Road intersection. Bankers Road, Newington Road, Harriott Road, Rovere Lane and Woolshed Lane all provide what would generally be termed (with reference to AustRoads Part 5 Intersections at Grade – AustRoads Part 5) as Type A intersections, where a through vehicle can pass a vehicle turning right utilising the road/verge but there is no other turning or acceleration/deceleration lane infrastructure.

The intersection of Bungendore Road with Macs Reef Road is designed as a Type B intersection, where an auxiliary lane provides for vehicles to proceed past a turning vehicles via a short sealed lane.

Conversely, the intersection of Macs Reef Road and Denley Drive provides acceleration and deceleration lanes and an auxiliary passing lane of the right hand turn; STAP is not aware of the design considerations which have led to the development of this substantial intersection infrastructure.

2.3 Annual Waste Stream Calculations

The Macs Reef Landfill does not have weighbridge facilities and therefore the quantity of waste has not been specifically Site-quantified. As such, the CO Report provides waste stream estimates based on two different calculation methods, which are examined below.

2.3.1 Council Vehicle Data Calculations

Council keeps records of vehicle arrivals at the Site, and has provided data from 2007/8 and 2008/9 for the CO Report (Table 7.1) which is reproduced below.

Vehicle Type	Total Number per annum	
	2007/2008	2008/2009
Cars/station wagons	3836	4163
Utilities/trailers	4849	6208
Trucks	1033	1499

Average tonnage estimates are then provided in DECCW Guidelines quoted in the CO Report (Table 7.2, reproduced below): -

Vehicle Type	Weight Factors (tonnes)	Waste Type
Cars/station wagons	0.06	All mixed waste
Utilities/trailers	0.30	All mixed waste
Trucks		
(a) Single rear axle with 2 tear wheels or 4 small wheels	0.62	Municipal, commercial and industrial waste
(b) Single rear wheel with 4 normal sized wheels	1.16	Municipal, commercial and industrial waste
(c) Average of categories (a) & (b) [1]	0.89	Municipal, commercial and industrial waste

Using this data, the CO Report calculates the following waste tonnage ranges: -

- 2007/2008 Tonnage range 2325tpa – 3042tpa
- 2008/2009 Tonnage range 2883tpa – 3851tpa

2.3.2 Macs Reef Catchment Calculations

The use of the Site catchment area, population numbers and the application of a waste generation factor provides an alternative estimate of waste delivered to the Site. Using Council and Census data and estimates, the CO Report estimates a Site catchment of some 1,414 properties.

This in turn provides and estimates of waste demand based on URS estimates in the Waste Management Strategy prepared for Council in 2005 which suggests a waste generation rate of 1 tonne of waste to landfill per rateable property; using the URS waste generation figure equates to an annual tonnage to landfill of 1,414 tonnes.

Conversely, an estimate sourced from a report by Pryor Knowledge is based on an extrapolation of the tonnages of waste being delivered to Macs Reef landfill on a per week basis, vehicle counts and EPA waste factors; the Pryor Knowledge report states an annual tonnage receival of 4,244tpa. Our understanding is that the survey data collected for this assessment was over a very short period, and that tonnage estimates/vehicle were factored based on observations also.

Appropriately therefore, the CO Report provides a final assessment method based on NetWaste data for other local Council areas. Utilising comparative data for the Central Region, the CO Report estimates an annual tonnage for Macs Reef Landfill of 2,678tpa – 2,960tpa; utilising the average NetWaste generation rates it would be 3,252tpa – 3300tpa.

2.3.3 Annual Waste Calculations Summary

Clearly, the tonnage estimates provided by these different calculations vary significantly, from a low of 1,414tpa to a maximum 4,244tpa; the estimate provided with reference to actual vehicle numbers fits neatly between these two extremes, as summarised in 7.10 of the CO Report as reproduced below: -

Data Source	Estimated Tonnes of Waste received at Macs Reef Landfill per annum
Extrapolation of vehicle data	
• 2007/08 (using the DECCW waste factors)	2,325 - 3,042*
• 2007/08 (using an average waste factor for trucks)	2,604
• 2008/09 (using the DECCW waste factors)	2,883 - 3,851*
• 2008/09 (using an average waste factor for trucks)	3,446
Extrapolation of URS waste generation data	1,414
Extrapolation of Pryor Knowledge waste generation data	4,244
Extrapolation of NetWaste data for the Central Region	2,960
• On a per capita basis	2,687
• On a per property basis	
Extrapolation of NetWaste's average generation rate data	
• On a per capita basis	3,300
• On a per property basis	3,252

Based on the results detailed above, the CO Report adopts an annual tonnage estimate of 3,450tpa.

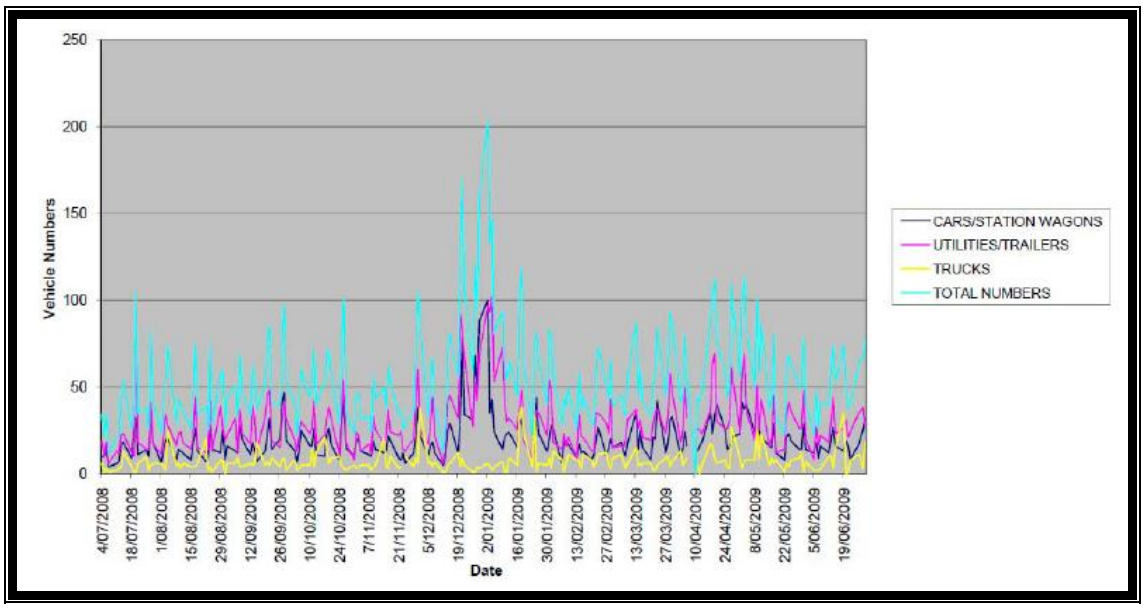
So what are the implications of using the annual tonnage estimate suggested in the CO Report as opposed to other tonnage estimates? Primarily – and specifically relevant to this Review – the waste capacity has a direct relationship to traffic generation. While the existing traffic generation of the Site is essentially known (based on vehicle surveys) the future vehicle generation must be estimated with regard to future waste capacity, in turn based on the existing waste capacity.

Notwithstanding, and as detailed in **Section 2.4** below, reducing annual capacities and vehicle movements down to an essential design period – daily and peak hour demand – reveals that the actual variations in vehicle movements based on the different waste capacity estimates is not as significant as it may seem.

2.4 Existing Traffic Generation

From a simple traffic generation perspective, the vehicle surveys provided by Council show that the Site generated approximately 9,718 vehicles per annum (vpa) in 2007/8, and some 11,870vpa in 2008/9. STAP notes that these figures represent single vehicles (and therefore single vehicle trips) and would not likely include staff and other service etc trips. **As such, STAP estimates that the total annual generation of the Site would be approximately 20,000 vehicle trips per annum (vtpa) in 2007/8, and some 25,000vtpa in 2008/9.**

In determining the potential impact of this level of traffic it is more appropriate in our opinion to provide a weekly and daily flow estimate. Data provided by Council (reproduced from the CO Report below) over 2008/9 shows that over the 4 day opening periods of the Site (Friday to Monday) traffic generation was relatively 'flat', with the exception of the Christmas/January holiday period where generation significantly exceeded that of an average week.



The key figures in our opinion are the existing peak flow for each vehicle type, being: -

- Peak daily car generation 100 vehicles/200 trips (Sunday 2/1/2009)
- Peak daily utility/trailer generation 100 vehicles/200 trips (Sunday 2/1/2009)
- Peak daily truck generation 38 vehicles/76 trips (Sunday 18/1/2009)

As shown in the data, the potential exists for these peak trips by vehicle type to occur in a single day; as such, it is our opinion that a super peak generation for the Site (based on traffic flows) would be in the order of 240 vehicles (i.e. the vehicles shown above plus some staff trips), or 480 vehicle trips on the super peak day. A maximum peak hour flow (appropriately estimated at 15% of the daily flow) would therefore be approximately 72vtph (two-way).

This super peak day represents a flow of approximately 1.92% of the total yearly flow; this is in our opinion a suitable percentage to apply to the future annual Site generation to determine peak demands.

Finally, STAP notes that in the design of intersections on rural roads, it is appropriate to utilise holiday peak periods when traffic flows can be higher than during non-holiday periods. The fact that the Site is also generating a peak traffic load during this period confirms that the peak January generation is appropriate for analysis.

2 The Waste Transfer Station

2.1 Site Components

From an access, traffic and parking perspective, the CO Report identifies the following key components for the proposed WTS: -

- Access to the facilities will be limited to vehicles of less than 2 tonnes
- Staff facilities are to be provided for 1 staff member
- Acceptable materials in addition to domestic waste include batteries; oil; e-waste; small cut-up metal pieces; small swappable items; other small valuable items
- Materials that will not be accepted include green-waste; commercial quantities of commercial and industrial (C&I) waste, or construction and demolition (C&D) waste; clean fill or VENM; tyres; mattresses; white goods and large scrap metal; large items including furniture; asbestos; chemicals; and dead animals
- A small Buy Back Centre is to be included (similar size to Captains Flat WTS). The Centre is to be co-located with the staff facilities.
- Access roads and manoeuvring areas are to be bitumen sealed or concrete
- Access is to be off the unnamed gravel road (Site Access Road)
- The gravel road is to be upgraded in accordance with DCP requirements (Road Type 10) from Macs Reef Road to the entrance to the new facility
- The intersection of the existing unnamed road and Macs Reef Road is to be upgraded to RTA standard's
- A growth rate of 1% is to be allowed for
- The landfill will continue to operate until the WTS becomes fully operational.

From the outset therefore, it is essential to note that the Site would generate less waste demand as a result of many of the bulkiest landfill items no longer be accepted at the Site. These items would need instead to be delivered to one of Council other landfill sites (Bungendore).

In addition, with the exception of service vehicles and vehicles transferring the collection bins to the Bungendore WTS, the Proposal would essential remove heavy vehicle traffic from the Site, with a 2 tonne limit providing essentially for cars, wagons, utilities and trailers only.

2.2 Future Waste Stream Calculations

As discussed above, the CO Report adopts a total 'existing' annual tonnage of waste to landfill of 3,450 tonnes for the Site (for design purposes), and bases the assessment of future demand on this figure.

In calculating the tonnage of material to be accepted at the WTS and then transferred to the Bungendore WTS, material that will not be accepted at the WTS needs to be excluded from the adopted total design tonnages. Based on information provided by Pryor Knowledge in regard to waste type percentages, the CO Report applies those percentages to the future Site operations (as per Table 9.2, reproduced below): -

	Palerang Landfills Overall (tpa)	% Waste stream	Macs Reef WTS (tpa)
Total waste stream	**9500**		**3450**
Materials not accepted at Macs Reef WTS			
garden organics	1000	10.5%	
difficult organics (C&I portion)	1000	10.5%	
stumps	25	0.3%	
bricks & concrete	750	7.9%	
fittings & fixtures	175	1.8%	
white goods	10	0.1%	
steel	150	1.6%	
non-ferrous	10	0.1%	
other out of area	2350	24.7%	
total	**5470**	**57.58%**	**1986**
Materials not include in disposal waste stream (recyclable)			
containers, P&C	250	2.6%	
other recyclables	47	0.5%	
oils and batteries	3	0.0%	
total	**300**	**3.16%**	**108.9**
Remaining waste stream for disposal	**3730**	**39.26%**	**1355**
Totals	9500	100.00%	3450

Based on this analysis the base design tonnages for transport from Macs Reef WTS to a waste disposal facility or recycling facility (excluding oil) are:

- Annual tonnage for disposal = 1,355
- Annual tonnage for recycling = 109

The CO Report further states that Council, in conjunction with the Working Group, has ascertained from its community that: -

- Approximately 19% of the residents in the WTS catchment utilise a private collection service and intend to continue with that service

- Of the residents in the catchment that do not use a private service, approximately 15% do not use the Macs Reef Facility and do not intend to change this practice

The CO Report applies these factors (as instructed by Council) to the estimated annual waste stream to provide the following demand figures; -

- Accepted annual waste stream for disposal is 944 tonnes
- Accepted annual waste steam for recyclables is 76 tonnes

STAP notes that upon a review of the CO Report worksheets it was determined that a deduction of 14% was used for those not intending to use the Site, as opposed to the surveyed 15%; the correct annual waste stream for disposal would therefore be 932tpa.

The CO Report then calculates a 1% average growth rate in the waste stream based on Council estimates; the table showing this (Table 9.3) is reproduced below: -

Waste Steam	Currently	In 5 yrs	In 10 yrs	In 20 yrs	In 50 yrs
Waste Stream for Disposal	944	992	1042	1151	1552
Waste Stream for Recycling	76	80	84	93	125

Based on the revised total of 933tpa outlined above, STAP has calculated the following future waste demands: -

Disposal Waste TPA			Recyclable TPA		
Year	Growth %	933	Year	Growth %	76
1	1.01	942.3	1	1.01	76.8
2	1.01	951.8	2	1.01	77.5
3	1.01	961.3	3	1.01	78.3
4	1.01	970.9	4	1.01	79.1
5	1.01	980.6	5	1.01	79.9
10	1.01	1030.6	10	1.01	84.0
15	1.01	1083.2	15	1.01	88.2
20	1.01	1138.4	20	1.01	92.7
50	1.01	1534.4	50	1.01	125.0

The growth estimates provided by STAP are not significantly different to those provided in the CO Report, and if anything provide a lower estimate of future waste demands than the CO Report.

2.3 Future Traffic Generation

2.3.1 Base and 20 Year Forecast Flow Range

To provide for a range of future traffic generation forecasting, STAP has utilised the percentage breakdown of materials accepted and not accepted at the future WTS and applied those percentages to a number of different scenarios, including: -

- Super-Peak Waste Capacity (4,244tpa as derived from household generation data)
- Super-Peak Traffic Generation (as derived from 2008/2009 vehicle survey)
- Maximum car or wagon/utility or trailer breakdown breakdown
- Future forecast (20 years)

The results of this analysis are provided below.

Table 2.2.1 Base Year Maximum Capacity Calculations

Annual Tonnage Estimate (CO Report)				1007.6
Vehicle Type	Vehicle Capacity	Tonnage per Vehicle Type	% Vehicle Type	Annual Trips per Vehicle Type
30% Cars				
Cars	0.06	302.3	30%	5038.1
Utilities/Trailers	0.3	705.3	70%	2351.1
Total		1007.6	100%	**7389.2**
Annual Trips				14778
% Annual Trips on Peak Day	1.9%			**283.7**
Peak Hour	15%			**42.6**
40% Cars				
Cars	0.06	403.0	40%	6717.4
Utilities/Trailers	0.3	604.6	60%	2015.2
Total		1007.6	100%	**8732.6**
Annual Trips				17465
% Annual Trips on Peak Day	1.92%			**335.3**
Peak Hour	15%			**50.3**
50% Cars				
Cars	0.06	503.8	50%	8396.8
Utilities/Trailers	0.3	503.8	50%	1679.4
Total		1007.6	100%	**10076.1**
Annual Trips				20152
% Annual Trips on Peak Day	1.92%			**386.9**
Peak Hour	15%			**58.0**
60% Cars				
Cars	0.06	604.6	60%	10076.1
Utilities/Trailers	0.3	403.0	40%	1343.5
Total		1007.6	100%	**11419.6**
Annual Trips				22839
% Annual Trips on Peak Day	1.92%			**438.5**
Peak Hour	15%			**65.8**

Annual Tonnage Estimate (Household)				1239.5
Vehicle Type	Vehicle Capacity	Tonnage per Vehicle Type	% Vehicle Type	Annual Trips per Vehicle Type
Cars	0.06	371.9	30%	6197.5
Utilities/Trailers	0.3	867.7	70%	2892.2
Total		1239.5	100%	**9089.7**
Annual Trips				18179
% Annual Trips on Peak Day	1.9%			**349.0**
Peak Hour	15%			**52.4**
Cars	0.06	495.8	40%	8263.4
Utilities/Trailers	0.3	743.7	60%	2479.0
Total		1239.5	100%	**10742.4**
Annual Trips				21485
% Annual Trips on Peak Day	1.92%			**412.5**
Peak Hour	15%			**61.9**
Cars	0.06	619.8	50%	10329.2
Utilities/Trailers	0.3	619.8	50%	2065.8
Total		1239.5	100%	**12395.1**
Annual Trips				24790
% Annual Trips on Peak Day	1.92%			**476.0**
Peak Hour	15%			**71.4**
Cars	0.06	743.7	60%	12395.1
Utilities/Trailers	0.3	495.8	40%	1652.7
Total		1239.5	100%	**14047.8**
Annual Trips				28096
% Annual Trips on Peak Day	1.92%			**539.4**
Peak Hour	15%			**80.9**

Table 2.2.2 Forecast Year 2030 Maximum Capacity Calculations

Annual Tonnage Estimate (CO Report)				1231.0
Vehicle Type	Vehicle Capacity	Tonnage per Vehicle Type	% Vehicle Type	Annual Trips per Vehicle Type
30% Cars				
Cars	0.06	369.3	30%	6155.0
Utilities/Trailers	0.3	861.7	70%	2872.3
Total		1231.0	100%	**9027.3**
Annual Trips				18055
% Annual Trips on Peak Day	1.9%			**346.6**
Peak Hour	15%			**52.0**
40% Cars				
Cars	0.06	492.4	40%	8206.7
Utilities/Trailers	0.3	738.6	60%	2462.0
Total		1231.0	100%	**10668.7**
Annual Trips				21337
% Annual Trips on Peak Day	1.92%			**409.7**
Peak Hour	15%			**61.5**
50% Cars				
Cars	0.06	615.5	50%	10258.3
Utilities/Trailers	0.3	615.5	50%	2051.7
Total		1231.0	100%	**12310.0**
Annual Trips				24620
% Annual Trips on Peak Day	1.92%			**472.7**
Peak Hour	15%			**70.9**
60% Cars				
Cars	0.06	738.6	60%	12310.0
Utilities/Trailers	0.3	492.4	40%	1641.3
Total		1231.0	100%	**13951.3**
Annual Trips				27903
% Annual Trips on Peak Day	1.92%			**535.7**
Peak Hour	15%			**80.4**

Annual Tonnage Estimate (Household)				1514.0
Vehicle Type	Vehicle Capacity	Tonnage per Vehicle Type	% Vehicle Type	Annual Trips per Vehicle Type
Cars	0.06	454.2	30%	7570.0
Utilities/Trailers	0.3	1059.8	70%	3532.7
Total		1514.0	100%	**11102.7**
Annual Trips				22205
% Annual Trips on Peak Day	1.9%			**426.3**
Peak Hour	15%			**64.0**
Cars	0.06	605.6	40%	10093.3
Utilities/Trailers	0.3	908.4	60%	3028.0
Total		1514.0	100%	**13121.3**
Annual Trips				26243
% Annual Trips on Peak Day	1.92%			**503.9**
Peak Hour	15%			**75.6**
Cars	0.06	757.0	50%	12616.7
Utilities/Trailers	0.3	757.0	50%	2523.3
Total		1514.0	100%	**15140.0**
Annual Trips				30280
% Annual Trips on Peak Day	1.92%			**581.4**
Peak Hour	15%			**87.2**
Cars	0.06	908.4	60%	15140.0
Utilities/Trailers	0.3	605.6	40%	2018.7
Total		1514.0	100%	**17158.7**
Annual Trips				34317
% Annual Trips on Peak Day	1.92%			**658.9**
Peak Hour	15%			**98.8**

With reference to the tables above, key figures include: -

- A range in peak hour flows for the base year from 43vtph (average waste, low car percentage) to 91vph (maximum waste, high car percentage).

- A range in peak hour flows for a 20 year forecast flow from 52vtph (average waste, low car percentage) to 99vph (maximum waste, high car percentage).

2.3.2 Best Estimate Base & 20 Year Forecast Flow

Based on all available information, and specifically with reference to the average percentage car/wagon from the 2007/2008 and 2008/2009 data, for design purposes STAP is of the opinion that an upper 50% percentage to cars/wagons should be applied. Additionally, the weight of available data indicates that the maximum waste stream estimate is high, i.e. that the estimate provided for design purposes in the CO Report of 3,450tpa is a good design capacity for analysis.

Using these two factors, the peak hour flow for a 20 year forecast flow is 71vph. By coincidence, this is an almost identical peak hour flow to the current Site peak hour flow (estimated at 72vph).

2.3.3 Traffic Generation Conclusions

While the future WTS would have a lower waste stream capacity, the vehicles able to access the Site have a lower waste carrying capacity, and as such vehicle trips would increase proportionally. Notwithstanding, based on all available information it is the opinion of STAP that: -

- The average daily and peak hour generation of the Site would be lower than the existing generation of the Site.
- The super peak daily and peak hour generation of the Site would be lower than the existing generation of the Site.

- The average daily and peak hour generation of the Site would not reach existing levels until approximately 20 years into operations.
- The super peak daily and peak hour generation of the Site would not reach existing levels until approximately 20 years into operations.

Additionally: -

- For design purposes, it is not in our opinion appropriate to base the design of any required intersections etc on forecasts beyond 20 years.

- The Site would generate only a very minor heavy vehicle generation, and specifically a small number of truck (or truck and dog) trips per week to take the proposed waste bins to another Council waste facility.

2.4 Proposed Infrastructure Upgrades

2.4.1 Intersection Site Access Road & Macs Reef Road

The CO Report provides recommendations for the upgrade of the intersection of the Site Access Road & Macs Reef Road with reference to Section 4 of the RTA Road Design Guide (RTA RDG), and the traffic flows estimated in the CO Report.

As outlined in sections above, STAP has determined that while traffic flows will for some years be lower to the WTS than generated by the existing Site operations, it is the case that the potential peak intersection flows determined by STAP are slightly higher than those used in the analysis in the CO Report.

Notwithstanding, reference to both the RTA RDG and to AustRoads Part 5 indicates that delays (levels of service) at the intersection would in and of themselves be very minor even for a 20 year forecast. As such, the provision of auxiliary lanes at the intersections is much more a safety consideration than a traffic efficiency consideration

The detailed review and design of an appropriate intersection treatment is outside the scope of this Review; however STAP would make the following comments: -

- The provision of a AUR for the right hand turn movement from Macs Reef Road to the Site Access Road is an our opinion an appropriate treatment, providing for right hand turning vehicles without impacting through movements.

  Such an intersection design would be almost identical to that provided at the intersection of Macs Reef Road & Bungendore Road, which would likely have higher traffic flow demands (though we note that sight distance at the Bungendore Road intersection is superior).

- The provision of channelized turn bays or acceleration/deceleration lanes may provide an additional level of safety, but the costs would need to be carefully examined. STAP notes that the intersection of Macs Reef Road & Denley Drive, which provides a long Type B passing lane of the right hand turn movement to Denley Drive as well as short deceleration and acceleration lanes, provides some guidance for such an intersection design. STAP is not aware of the specific traffic demands or issues which led to the Denley Drive design being implemented.

- The minimal truck demands of the future Site operations suggest that the provision of acceleration lanes in particular (which allow for such vehicles to attain a reasonable speed prior to entering the traffic flow) are not warranted; appropriate signage however is likely to be required.

Ultimately, the design of the intersection will provide a balance between maximum safety and cost considerations. Any design process – in accordance with the appropriate guidelines/standards - will require a more detailed investigation of these issues, but it is our opinion that from a basic traffic perspective little additional infrastructure is required to provide for the forecast traffic demands of the Site in and of itself, particularly as those flows would be no greater that existing flows (which are provided for by a simple priority intersection).

STAP notes the recommendation in the CO Report for a survey at the intersection to determine vehicle demands by direction; STAP would agree that such a survey (and consideration of sight distances, gradients etc) would be required as part of the intersection planning process. Further to a direction survey, intersection modelling (e.g. SIDRA) may also be used to provide more certainty of future operations based on alternative intersection design proposals (though again any upgrade would in our opinion have more to do with safety considerations than delay considerations).

2.4.2 Site Access Road Upgrade

It is proposed that the Site Access Road be upgraded in accordance with current guidelines/standards; this is appropriate in our opinion given that the Site will be generating a constant (if not high) traffic flows for many years (based on current forecasts).

2.4.3 On-Site Access

The design of on-site access roads and turning areas will need to appropriately reference AS 2890.1 and AS 2890.2.

2.5 Additional Issues

2.5.1 Car Parking

With reference to the provision of parking at other (significantly larger and busier) waste transfer sites assessed by STAP, it is our opinion that the provision of 6 on-site parking spaces would be more than adequate for the Site.

As discussed above, the design of the parking spaces and access aisle to those spaces would also be provided in accordance with AS 2890.1.

2.5.2 Truck Transfer

Again based on our previous experience, STAP would recommend that the movement of heavy vehicles (carrying the bins or compacted waste from the Site) be conducted outside of peak periods, and if possible be provided for via different internal access roads than private vehicles.

3 Conclusions

Following a detailed review of the existing and future waste and traffic generation potential of a proposed Waste Transfer Station at the Macs Reef Landfill Site, STAP has concluded that: -

- The CO Report provides an appropriate base waste stream estimate for the analysis of future Site requirements; the use of higher [available] estimates does not result in significantly higher traffic generation estimates, particularly when considering daily and peak hour design periods.

- Based on what would essentially be worst case scenarios including maximum waste stream capacity and maximum mode to car/wagon for arrivals, the super peak traffic generation of the WTS would not exceed the existing super peak traffic generation of the Site.

- Available data suggests that both average and super peak flows of the WTS will be lower than existing average and super peak flows of the Landfill, and that the WTS flows would not return to existing flows for approximately 20 years.

- STAP strongly supports the upgrade of the intersection of Macs Reef Road & Site Access Road. The upgrade will require additional detailed analysis in regard to maximum safety returns for dollars spent; there is no evidence that delays, levels of service or general capacity is a significant issue in providing the design.

- All new works on and off site should be completed with reference to the appropriate Guidelines and Standards.

Issues Further to Peer Review

As described above, Stapleton Transportation & Planning Pty Ltd (STAP) was engaged by Palerang Council to prepare a Peer Review of the transportation issues outlined in the Concept Options Report – Macs Reef Waste Transfer Station (CO Report) prepared by Quadro Australia Pty Ltd (Quadro) in February 2010.

The CO Report examines the future operation of the existing Macs Reef landfill as a waste transfer station, and provides forecasting and assessment of the future demands of the Site, and the requirement local infrastructure by which the Site could operate efficiently and safely.

Further to the completion of our Peer Review as detailed above, additional data was provided to STAP that raised questions in regard to some of the forecast estimates provided in the CO Report, and therefore the conclusions/recommendations provided in the CO Report.

This should not in our opinion be seen as a criticism of the CO Report; as detailed in our Review above, it is the opinion of STAP that the CO Report provides an appropriate assessment methodology and thence conclusions/recommendations based on the data available for that assessment, data primarily provided by Council.

Notwithstanding, the new data provided by Council suggested to STAP that a revised assessment of the Site is required.

The most significant issue relates to the potential traffic generation growth at the Site, which based on traffic surveys at the Site provided by Council has grown at a significant rate over the 4 years of available data; indeed, the surveys show that traffic has almost tripled at the Site over that period. To summarise, the data provided by Council shows: -

- 2007/8 approximately 9,500 vehicles per year
- 2008/9 approximately 12,000 vehicles per year
- 2009/10 approximately 19,000 vehicles per year
- 2010/11 approximately 26,000 vehicles per year

This level of growth may (or may not) continue for some time into the future; the factors behind this level of growth need in our opinion further assessment. Further to STAP raising this issues, Councils provided a response (Transport Review (Stapleton Transportation & Planning) for proposed Macs Reef Waste Transfer Station, 14th December 2010) which indicates the appropriateness of the previously recommended intersection upgrade of Macs Reef Road and the Site Access Road.

STAP would agree that for the foreseeable future the proposed intersection upgrade (AU) would suffice, but again we note that the potential for this surveyed growth to continue (into the future) must be taken into account, as such growth over a further 5 years would potentially require a different type of intersection upgrade.

Anton Reisch
Stapleton Transportation & Planning Pty Ltd
20th December 2010